

WISCONSIN STORMWATER RULES

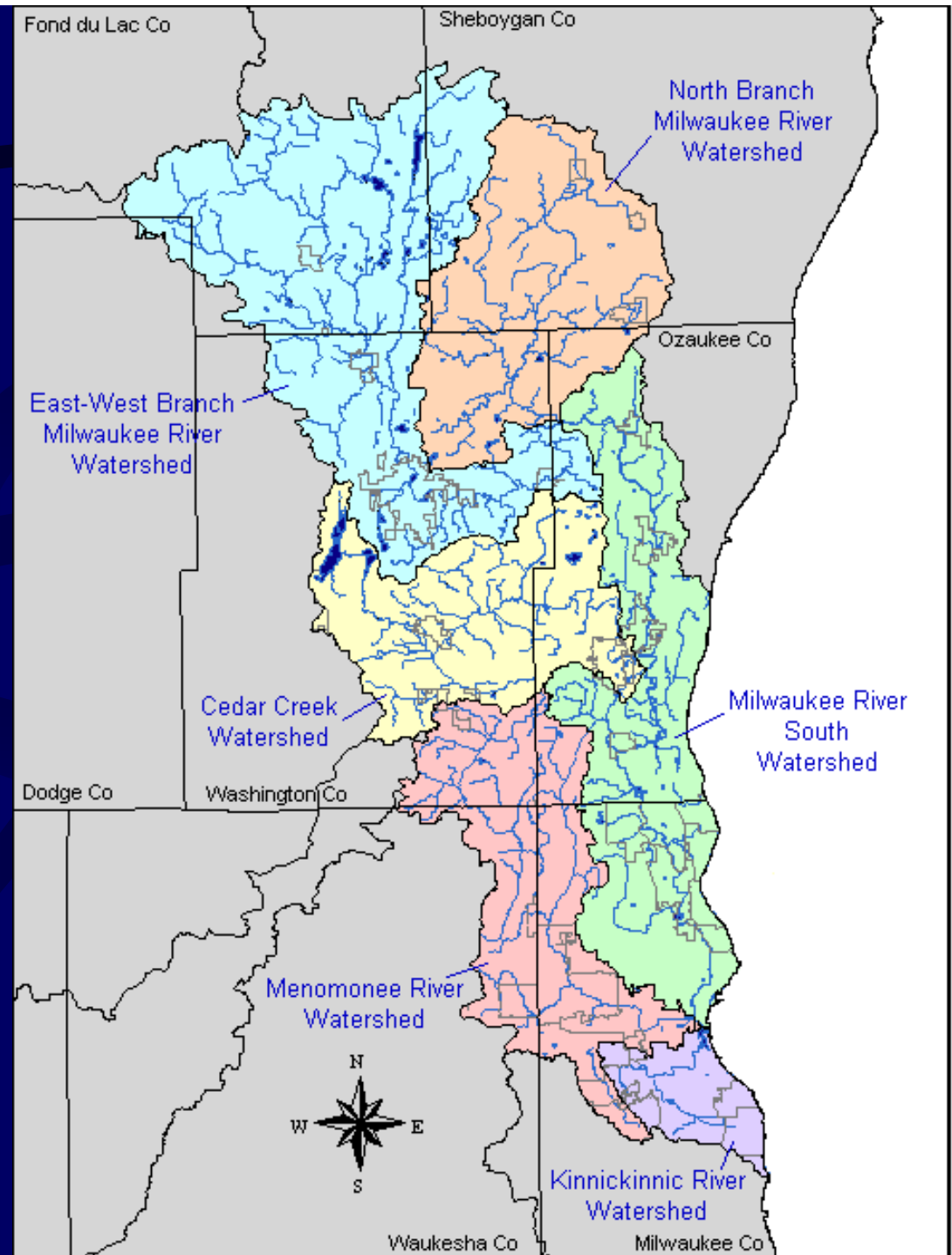
NR216, NR151 & NEW TECHNICAL STANDARDS

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The Milwaukee River Basin by Numbers

- 6 major watersheds
- 1,000 miles of streams
- 100 lakes
- 80,000 acres of wetlands
- 35 miles of Lake Michigan shoreline
- 1 million residents
- 900 square miles of land in portions of
 - 7 counties
 - 12 cities
 - 24 villages



The Milwaukee River Basin

Ruralto..... Urban



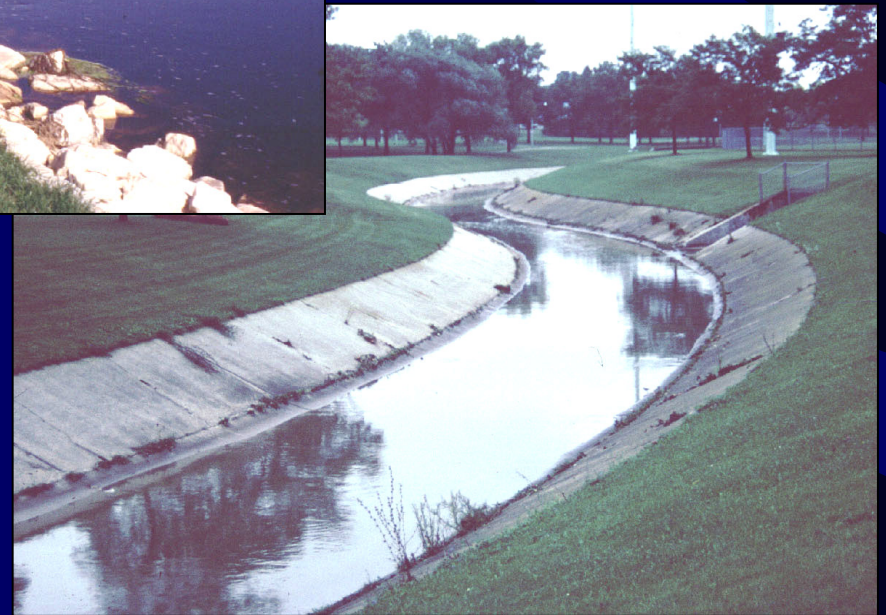
The Evolution of a Stream

Research shows:

**10% Impervious:
Stream is Impacted**



**25% Impervious:
Stream is Severely
Impacted**



Milwaukee Harbor after heavy rain

NONPOINT SOURCE POLLUTION



NR 216

WI's Storm Water Permit Rule

- Adopted in 1994
 - Administered by Department of Natural Resources
 - Requires Compliance with **NR151 Standards**
- Municipal Permits
- Industrial Permits
- Construction Site Permits



NR 151 Performance Standards



Effective Oct. 1, 2002
(some standards effective
Oct. 1, 2004)

- Non-Agricultural Performance Standards (Subch. III)
- Technical Standards Develop. Process (Subch. V)



NR 151 Performance Standards

Non-Agricultural Performance Standards (Subchapter III)

- Construction Site Erosion Control
- Post-Construction Storm Water Management
- Developed Urban Area - Pollutant Loading Reduction

NR 151 Construction Standards



Applicability

- Sites with 1+ acre(s) of land disturbance
- Since March 10, 2003 (federal requirement)
- Commercial Sites to Department of Commerce
- Implemented through existing permits
 - NR216, Ch 30, TRANS 401

NR 151 Construction Standards

Construction Site Erosion Control

- Written erosion & sediment control plan
- 80% Sediment controlled, by design to the **Maximum Extent Practicable**
- Owner Responsible

NR 216 Construction Site Permits Process

- Site owner submits Notice of Intent (NOI) at least 14 working days before start of construction
 - Self certification (no plans required with NOI)
 - Owner must sign NOI & submit fee
- DNR screens for wetlands, endangered resources & historic/archeological sites
 - DNR may request plans and conduct plan review
- DNR sends General Permit to site owner

NR 151 Post-Construction Standards

Post-Construction Standards

- Written storm water plan
- TSS controlled by design to MEP up to **80%** for *new development*, **40%** for *redevelopment*
- 2-year 24-hour peak flow control
- Infiltration standard
- Protective areas (buffers)

NR151 Post-Construction Standards

Infiltration Standard (by design)

- Residential
 - Infiltrate **90%** of the average annual predevelopment infiltration volume (or **25%** of the 2-yr, 24-hr storm)
 - Cap: 1% of project site
- Non-residential
 - Infiltrate **60%** of the average annual predevelopment infiltration volume (or **10%** of the 2-yr, 24-hr storm)
 - Cap: 2% of project site
- *Exclusions & Exemptions: NR151.12(5)(c)*

NR 151 Post-Construction Standards



Protective Areas

- Must maintain or restore a vegetated buffer along surface waters, from impervious surfaces
- Buffer Widths
 - Outstanding & Exceptional Resource Waters (ORW/ERW): 75-foot buffer
 - Lakes & Streams: 50-foot buffer
 - Wetlands: 10 to 75-foot buffer

Post-Construction Standards

Wetland Buffer Widths

- Special natural resource interest (NR103.04)
 - Trout streams, endangered/threatened species, fish and wildlife refuges, calcareous fens, wild/scenic rivers
 - 75 feet
- Highly Susceptible Wetlands
 - Sedge meadows, fens, bogs, forested wetlands, fresh wet meadows, shallow/deep marshes, various swamps
 - 50 feet
- Less Susceptible Wetlands
 - Dominated by invasive species (reed canary grass)
 - 10% average width: 10-foot min and 30-foot max

Post-Construction Standards

Protective Areas Exemptions

- Redevelopment
- In-fill < 5 acres
- Structures that cross or access waterways
 - Bridges, culverts, boat landings
- Sites with no runoff entering waterway

Note:

- *BMPs can be located in protective area*
- *Can be disturbed during construction*

Developed Urban Area Standards

NR 216 Permitted municipalities must also:

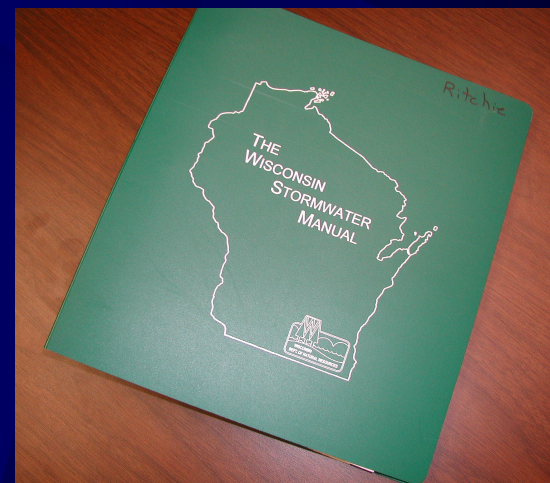
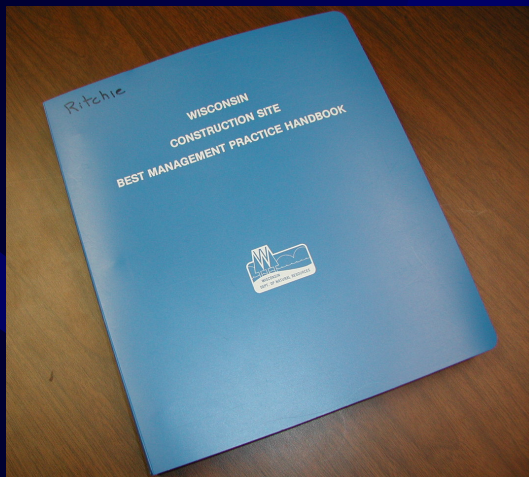
- Reduce total suspended solids by 20% (by 2008)
- Reduce total suspended solids by 40% (by 2013)
 - overall pollutant loading , determined by modeling

NR 151 Technical Standards (Subchapter V)

- DNR required to develop **technical standards** to implement construction, post-construction & developed urban area **performance standards**

NR 151 Technical Standards (Subchapter V)

- “New” Stand-Alone Technical Standards for Each BMP
- Replaces:
Blue Book & Green Book



Technical Standards

- Approved by Multiple Agencies:
 - DNR, DOT, Commerce, NRCS
- Meets NR151 Standards
- Easily Revised

**** Available on
DNR Website
(PDF Files)***



<http://dnr.wi.gov/org/water/wm/nps/stormwater.htm>

Erosion Control Technical Standards

- Erosion Mat (channel & non-channel)
- De-watering
- Ditch Checks
- Constr. Site Diversion
- Dust Control
- Grading for Temp. Erosion Control
- Polymers (water & land)
- Mulching
- Rip Rap
- Sediment Bales
- Sediment Basin
- Sediment Trap
- Seeding
- Silt Fence
- Silt Curtain
- Stone Tracking Pad
- Inlet Protection
- Turbidity Barriers
- Vegetative Buffer

Expected early 2006

Storm Water Technical Standards

- Bioretention for Infiltration
- Compost
- Infiltration Basin
- Infiltration Trench
- Rain Gardens
- Site Evaluation for Infiltration
- Swales
- Wet Detention Pond

Expected early 2006

Later 2006 : Proprietary Urban Storm Water Devices

Wet Detention Pond Tech Standard 1001



Infiltration Basin Tech Standard 1003

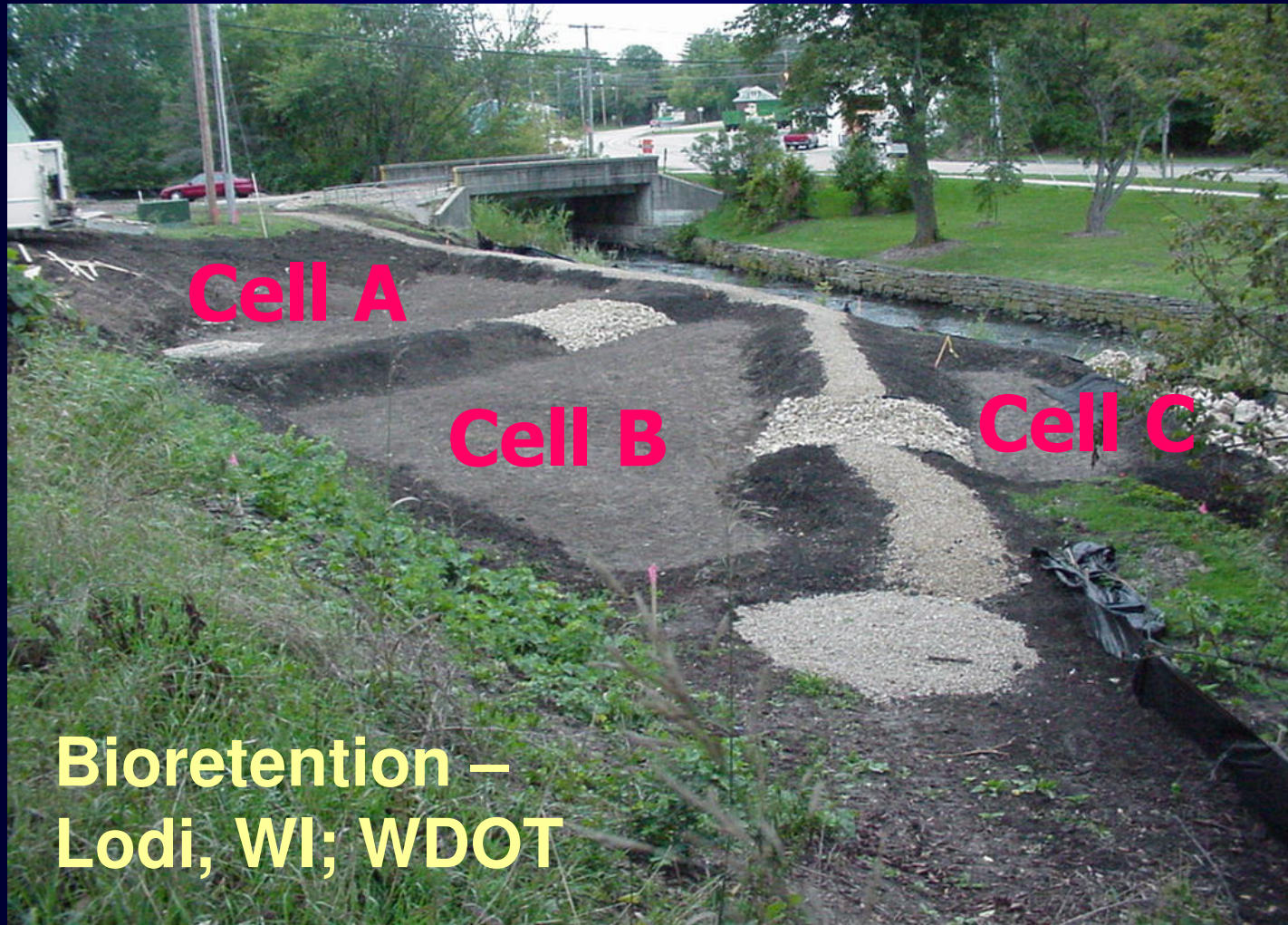


Infiltration Trench

(Standard to be Completed in 2006)



Bioretention Basin Tech Standard 1004



Rain Gardens

(Use DNR How-To Manual)



Rain Gardens



© John Gishnock III

Rain Garden Publications

- Prepared by DNR & UWEX
- Available on DNR Website



Can I Use Alternative BMPs & Meet NR151 Requirements?

- Rain Gardens
- Green Roofs
- Porous Pavement
- Proprietary BMP's

YES !

NR151 Requires 80% TSS Removal

- Following Technical Standards meets 80%
- However, Alternative BMPs can be used:
 - Model pollutant removal of BMP with SLAMM or P8
 - Or, provide literature / research demonstrating the effectiveness of BMP

Green Roof



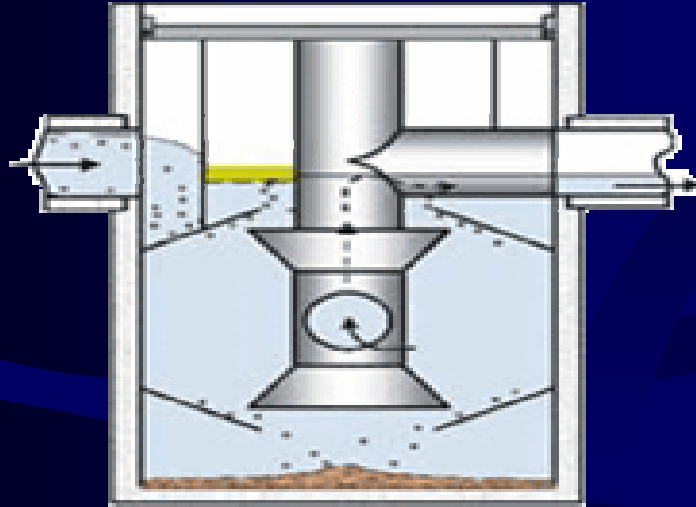
Green Roof



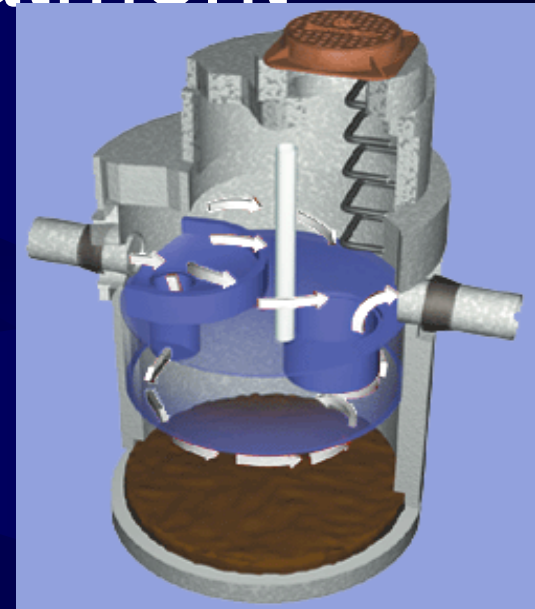
Porous Pavement



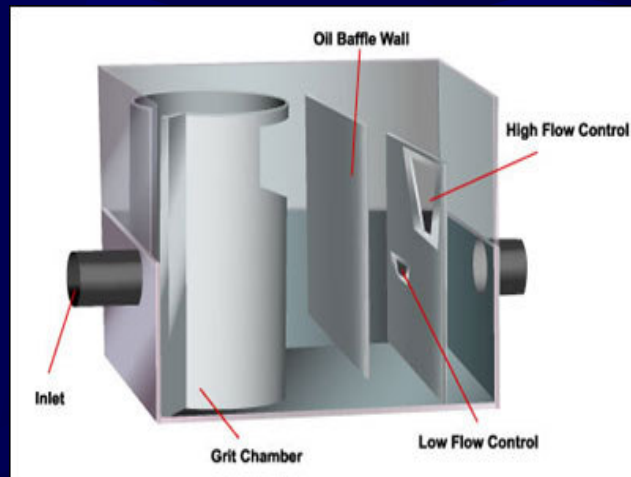
Examples of Proprietary BMPs Using Settling for Treatment



Downstream Defender



Stormceptor



Vortechs

Milwaukee Demonstration Site: I-794



BMPs: Vortechs &
Stormwater Mgt. Filter

Sponsors: WDOT,
WDNR, Third Ward,
City Milwaukee, USGS



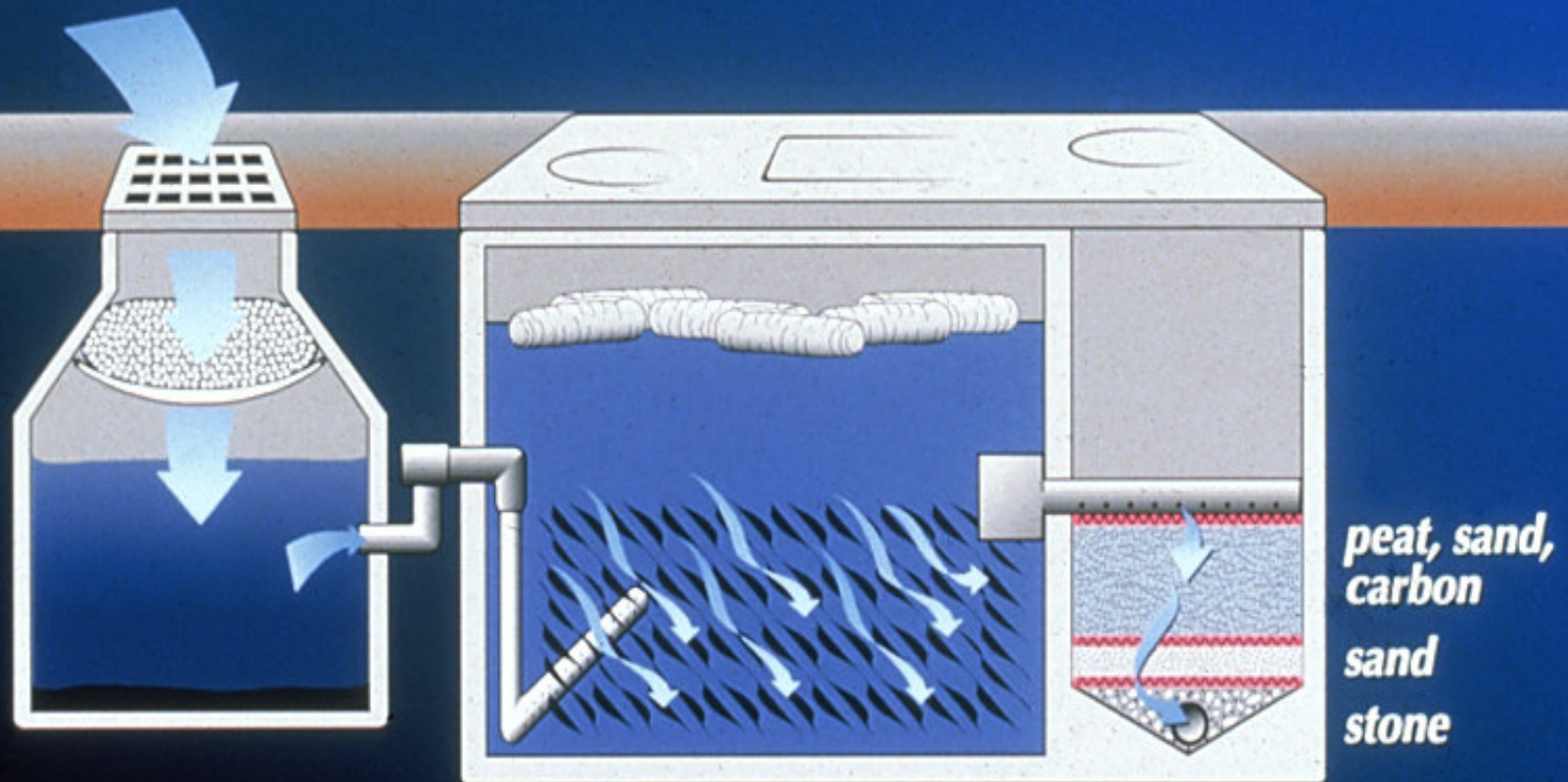
Vortechs Installation: Data Collected for 20 Storms in 2003 to 2004.



A photograph of a maintenance yard in Milwaukee. The scene is set on a wet, cracked asphalt surface that reflects the vehicles and the overcast sky. Several yellow trucks are parked in the yard. In the center, a yellow truck with a flatbed trailer is prominent, carrying a large yellow piece of machinery with two wooden pallets. To its left, another yellow truck is parked. Further left, a white portable toilet with the 'A1' logo stands near some yellow storage containers. In the background, more yellow trucks are visible, along with some trees and utility poles under a grey, overcast sky.

**Maintenance Yard in
Milwaukee – Drainage
Area 0.25 Acres**

Ruby Yard - Multi-Chamber Treatment Tank (MCTT)



For More Information

DNR Storm Water homepage

<http://dnr.wi.gov/org/water/wm/nps/stormwater.htm>